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The arthropod fauna of potato fields: composition and abundance

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Agriculture Canada
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SUMMARY

One of the basic requirements for high yield and high quality potatoes is good insect control. This in turn necessitates an understanding of the crop environment and more particularly of the arthropod community. This technical bulletin contains a complete list of the more than 565 different species of arthropods collected in a survey of New Brunswick potato fields carried on between 1979 and 1981. The total yearly catches of each species or group-species and the seasonal abundance of common or important groups are presented in tabular form. It will provide extension specialists, entomologists and quarantine officers with a checklist of insect species that can be found on potatoes and data on the relative abundance and seasonality of these arthropods.

Résumé

Pour obtenir des pommes de terre de haute qualité et un rendement élevé il faut, entre autres, bien contrôler les insectes nuisibles. Ceci requiert une bonne compréhension du milieu de culture et plus particulièrement de la communauté arthropodienne. Ce bulletin technique contient une liste complète des quelques 565 différentes espèces d'arthropodes recueillies lors d'un inventaire des champs de pomme de terre du Nouveau-brunswick réalisé de 1979 à 1981. Les captures annuelles totales de chaque espèce ou groupe d'espèces et l'abondance saisonnière des groupes communs ou importants sont présentées sous forme de tableaux. Ce bulletin fournira aux spécialistes de l'extension, aux entomologistes et aux officiers en charge de la quarantaine une liste de contrôle des espèces d'insectes susceptibles de se trouver sur pommes de terre et des données sur l'abondance relative et saisonnière de ces arthropodes.

INTRODUCTION

The potato is a solanaceous plant which originated from the Andes in Peru. Introduced in Canada in 1623, it is now planted in 108,300 ha of which 22,000 are in New Brunswick (CIP 1980, NBDA 1981). Due to the importance of export markets--36% of the province's total production (New Brunswick Department of Agriculture 1981)--particularly high standards of seed quality have been set for New Brunswick potatoes.

One of the basic requirements for high yield and high quality potatoes is good insect control. Insect pests are well known (Hodgson et al. 1974, MacGillivray 1979 a, b, Radcliffe 1982) but the rest of the arthropod community has never been fully surveyed (Shands and Landis 1964, Shands et al. 1965, 1972). It is important to know the entire fauna because all species are linked together by their effects on one another and the environment they share. Insect control methods do not affect only the target species but all the other ones that depend on it or simply inhabit the same immediate space.

A faunal survey of New Brunswick potato fields was carried out during the 1979, 1980 and 1981 growing seasons and has identified more than 565 different species or group species from the more than 477,150 specimens collected. To our knowledge this is the first comprehensive survey of arthropods in potato fields in North America. This bulletin provides a complete listing of the species collected each year. In a second part, the seasonal abundance of important or common arthropods (generally at the family level) is presented in a tabular form for each sampling method. Four sampling procedures were used to get as complete a picture as possible of the whole community, gather some information on their habitat preference (e.g. foliage or ground species) and their ability to disperse by flight (yellow water pan catches). The structure of the community has been described elsewhere (Boiteau 1983).

Specimens of each taxon are maintained in the potato reference collection at the Fredericton Research Station.

MATERIALS AND METHODS

Except for Charlotte, Saint John and Albert, all counties of New Brunswick were surveyed in the 1979 and 1980 growing seasons. In 1981 the survey was limited to the major potato growing areas of Carleton, Victoria and Madawaska. All fields belonged to growers participating in the New Brunswick potato pest management program. Some fields were insecticide free but most received between 1 and 6 spray applications. This was not considered detrimental, but on the contrary, an integral part of the artificial environment of the potato field. Fields were sampled by sweepnet, ground cloth, pitfall traps and yellow water pans.

Sweepnet samples were taken from a 60 x 60 m area approximately 60 m from the edge of each field. A scout walked between 2 rows swinging a 38 cm diam sweepnet upward alternatively on each row synchronized with successive steps. Four sets of 50 sweeps randomly selected were taken in each field. Samples were taken weekly from the time plants reached 38 cms to top kill or the end of August. Forty three, 45 and 6 fields were sampled in 1979, 1980 and 1981 respectively.

The location and timing of ground cloth samples were similar to those used in the sweepnet procedure. A 1 meter square cloth was unfolded between 2 rows and about 2 m of foliage from each side vigorously shaken over the cloth. Four samples were collected randomly in each of 43, 35 and 6 fields in 1979, 1980 and 1981 respectively.

Pitfall traps consisted of a 0.5 L plastic cup (31 cm perimeter, 12 cm depth) sunk into the top of the row and 1/3 filled with a 50% solution of ethylene glycol and water as preservative. A 15 x 15 cm aluminum shade cover mounted on 15 cm nails was positioned approximately 5 cms above the cup to protect its contents from precipitation. Traps were emptied once a week from the time of planting to the end of August. Ten to twenty traps were placed in each of 21, 16 and 7 fields in 1979, 1980 and 1981 respectively.

Yellow water pans measured 35 x 47 cm. Two pans were located in the center of a 60 x 60 m area adjacent to the access road but halfway between the sidelines of each field. The first trap was 15 m from the edge and the second one 30 m further on the same row. Traps were emptied twice a week. Traps were operated in 51 fields in 1979, 51 in 1980 and 9 in 1981.

All samples were brought back to the laboratory for identification and counting. Collections were sorted into morpho-species which were pinned and assigned a reference number. Representative specimens of every putative species were then submitted to specialists at the Agriculture Canada Biosystematic Research Institute, Ottawa, for identification.

ARTHROPODS ASSOCIATED WITH POTATOES

This list contains all of the arthropod species or group-species collected in potato fields throughout the province of New Brunswick during three successive years. The list is arranged according to the classification of Borror et al. (1976) except for the families and genera that are arranged alphabetically. The total number of specimens collected is given for each taxon and each year.

Class			
Order		Total catch	
Family			
Species	1979	1980	1981
Arachnida	3,521	4,001	1,870
Diplopoda	109	993	667
Chilopoda	62	662	141
Insecta			
Collembola	208 ¹	69 ¹	34 ¹
Ephemeroptera	15	21	0
Orthoptera	165	155	41
Plecoptera	17	75	2
Thysanoptera	10,364	1,259	- ²
Hemiptera			
Alydidae			
Alydus eurinus (Say)	0	3	0
Anthocoridae			
Anthocoris sp.	29	14	0
Orius sp.	33	17	0
Aradidae			
Aradus sp.	0	1	0
Berytidae (?)	18	11	0
Corizidae			
Corizus sp.	0	9	0
Cryptocerata	12	0	18
Cydnidae			
Corimelaena pulicaria (Germar)	3	16	0
Sehirus cinctus (P.B.)	10	39	0

Order	Total catch		
Family			
Species	1979	1980	1981
<hr/>			
Lygaeidae			
Corythucha sp.	10	0	0
Cymus sp.	9	1	0
Geocoris sp.	8	10	0
Nysius sp.	2	0	0
Ortholomus sp.	1	1	0
Stygnorocoris pedestris (Fallen)	12	0	0
Unidentified	29	4	2
Miridae			
Adelphocoris lineolatus (Goeze)	12	3	6
Adelphocoris rapidus (Say)	1	0	0
Capsus ater (Linn.)	0	2	0
Dicyphus sp.	1	1	0
Halticus sp.	132	20	0
Irbisia reuter	0	4	0
Leptopterna dolbratus (Linn.)	1	1	0
Lygocoris sp.	1	1	0
Lygus sp.	909	650	0
Monalocoris americanus Wands.	32	1	0
Phytocoris sp.	12	0	0
Plagiognathus sp.	40	24	0
Plagiognathus chrysanthemi (Wolff)	0	19	0
Poecilocapsus lineatus (Fab.)	4	6	0
Stenodema sp.	46	5	0
Stenodema vicinum (Prov.)	5	3	0
Trigonotylus sp.	43	42	0
Unidentified	34	14	0

Order	Total catch		
Family			
Species	1979	1980	1981
<hr/>			
Nabidae			
Nabis sp.	19	0	0
Nabis ferus (Linn.)	4	15	0
Nabis flavomarginatus Scholtz	13	1	0
Nabis rufusculus Reuter	20	22	0
Pentatomidae			
Cosmopepla bimaculata (Thomas)	6	64	0
Euschistus tristigmus (Say)	6	3	0
Picronerus bidens (L.)	2	0	0
Sciocoris microphthalmus Flor.	1	1	0
Reduviidae			
Sinea diadema (Fab.)	1	1	0
Saldidae			
Unidentified	8	11	0
Tingidae			
Acalypta sp.	1	0	0
Aleyrodidae	331	26	0
Psyllidae	1,030	6,075	3
Aphididae			
Myzus persicae	1,670	646	15
Macrosiphum euphorbiae	13,044	6,981	247
Aphis nasturtii	6,162	3,270	112
Unidentified	69,586	41,986	1,559
Cercopidae			
Unidentified	951	1,748	21
Cicadellidae			
Agallia quadripunctata (Prov.)	5	-	-
Anoscopus sp.	6	-	-

Order	Total catch		
Family			
Species	1979	1980	1981
Anoscopus flavostriata (Don.)	1	-	-
Aphrodes bicinctus (Schr.)	1	-	-
Arboridia (Erythridula) crataegi	4	-	-
Athysanus argentarius Metc.	1	-	-
Draeculacephala antica (Wlk.)	4	-	-
Elymana sp.	84	-	-
Empoasca copula Dec.	1	-	-
Eupteryx atropunctata (Goeze)	43	-	-
Eupteryx flavoscuta Gill.	1	-	-
Evacanthus interruptus (L.)	2	-	-
Graphocephala coccinea (Forst.)	5	-	-
Graphocraerus ventralis (Fall.)	5	-	-
Helochara communis Fitch	52	-	-
Idiocerus lunaris Ball	3	-	-
Latalus (Errastunus) ocellaris (Fall.)	219	-	-
Macrophis basalis (Van D.)	19	-	-
Macrophis canadensis (Van D.)	9	-	-
Macrosteles fascifrons Complex	736	-	-
Oncopsis citra Hmlt. (ms name)	29	-	-
Oncopsis flavidorsum (Am. and Serv.)	56	-	-
Oncopsis sobria (Wlk.)	58	-	-
Ophiola osborni Ball	16	-	-
Scaphoideus sp.	96	-	-
Scaphytopius latus (Bak.)	49	-	-
Thamnotettix confinis (Zett.)	15	-	-
Unidentified	219	2,486	2,050
Delphacidae			
Liburnia incerta Van D.	18	0	0

Order	Total catch		
Family			
Species	1979	1980	1981
Membracidae	107	206	3
Fulgoroidea	56	2,067	23
Neuroptera			
Chrysopa sp.	20	2	0
Hemerobius sp.	12	36	0
Coleoptera			
Alleculidae			
Isomira quadristriata Couper	1	281	0
Anthicidae			
Anthicus sp.	12	2	0
Notoxus sp.	1	20	0
Biphyllidae			
Diplocoelus sp.	2	5	0
Buprestidae			
Agrilus sp.	2	2	0
Anthaxia sp.	0	3	0
Buprestis sp.	0	1	0
Chrysobotris sp.	0	4	0
Byrrhidae			
Byrrhus sp.	1	11	0
Simplocaria sp.	12	22	1
Syncalypta spinosa Ross	1	0	12
Cantharidae			
Cantharis sp.	16	12	1
Cantharis rufa L.	131	581	89
Chauliognathus pennsylvanicus DeGeer	8	1	0
Malthodes sp.	4	0	0
Podabrus sp.	8	2	17

Order		Total catch		
Family				
Species		1979	1980	1981
<i>Podabrus modestus</i> Say		10	0	0
<i>Podabrus rugosulus</i> Lec.		3	4	0
<i>Podabrus simplex</i> Coup.		0	2	7
Carabidae				
<i>Amara</i> sp.		28	105	33
<i>Anisodactylus sanctaecrucis</i> F.		6	51	10
<i>Agonum</i> sp.		85	74	421
<i>Agonum cupripenne</i> Say		0	111	0
<i>Agonum octopunctatum</i> F.		0	19	1
<i>Agonum placidum</i> Say		1,978	4,379	67
<i>Bembidion 4-Maculatum oppositum</i> Say		941	995	278
<i>Bradycellus</i> sp.		23	150	0
<i>Clivina</i> sp.		194	578	96
<i>Calosoma calidum</i> F.		0	2	0
<i>Carabus granulatus</i> L.		3	243	18
<i>Carabus nemoralis</i> Mull.		2	805	13
<i>Chlaenius sericeus</i> Forst.		0	12	12
<i>Chlaenius tricolor</i> DeGeer		0	14	1
<i>Dyschirius</i> sp.		2	25	11
<i>Elaphrus</i> sp.		0	3	0
<i>Harpalus</i> sp.		86	29	92
<i>Harpalus affinis</i> Schr.		36	335	499
<i>Harpalus rufipes</i> DeGeer		1,022	18,671	1,803
<i>Lebia</i> sp.		4	52	1
<i>Notiophilus</i> sp.		3	3	0
<i>Pterostichus lucublandus</i> Say and <i>Pterostichus melanarius</i> Ill. }		1,255	1,164	3,431
<i>Sphaeroderus</i> sp.		1	4	0

Order	Total catch		
Family			
Species	1979	1980	1981
<i>Stenolophus comma</i> F.	5	24	40
<i>Tachys</i> sp.	1	2	3
Unidentified	5	50	0
Cephaloidea			
<i>Cephaloon</i> sp.	66	0	0
Cerambycidae			
<i>Bellamira scalaris</i> (Say)	1	1	0
<i>Brachysomida bivittata</i> (Say)	0	1	-
<i>Clytus ruricola</i> (Oliv.)	1	0	-
<i>Cosmosalia chrysocoma</i> (Kby.)	2	2	-
<i>Monochamus scutellatus</i> Say	0	1	-
<i>Psenocerus supernotatus</i> (Say)	0	1	-
<i>Pygoleptura nigrella nigrella</i> (Say)	0	1	-
<i>Saperda tridentata</i> Oliv.	0	1	-
<i>Trachysida mutabilis</i> (Newm.)	2	1	1
<i>Typocerus velutinus</i> (Oliv.)	1	0	-
Chrysomelidae			
<i>Acalymma vittatum</i> (Fabricius)	0	1	0
<i>Altica</i> sp.	0	5	-
<i>Bromus obscurus</i> (L.)	0	1	-
<i>Calligrapha</i> sp.	0	1	-
<i>Calligrapha californica coreopsivora</i>	0	3	2
<i>Capraita subvittata</i> (Horn)	21	9	-
<i>Chartocnema confinis</i> Crotch	105	142	-
<i>Chrysomela</i> sp.	0	4	1
<i>Crepidodera</i> sp.	53	448	1,052
<i>Diachus auratus</i> (Fabricius)	2	5	-
<i>Dibolia borealis</i> Chevrolat	18	182	73
<i>Disonycha xanthomelas</i> (Dalman)	0	3	-

Order		Total catch		
Family				
Species		1979	1980	1981
<i>Donacia aequalis</i> Say		1	19	2
<i>Donacia emarginata</i> Kirby		0	3	7
<i>Donacia sulciollis</i> Lacordaire		0	5	0
<i>Epitrix</i> sp.		192	77	0
<i>Epitrix cucumeris</i> (Harris)		16,082	12,899	21
<i>Glyphuroplata porcata</i> (Melsheimer)		1	1	0
<i>Leptinotarsa decemlineata</i> (Say)		569	317	229
<i>Longitarsus</i> sp.		28	69	0
<i>Metriona bicolor</i> Fabricius		2	6	1
<i>Orsodacne atra</i> Ahrens		21	6	0
<i>Pachybrachis</i> sp.		0	2	0
<i>Phratora</i> sp.		1	1	2
<i>Phyllotreta cruciferae</i> Goeze		53	57	1
<i>Phyllotreta robusta</i> LeConte		2	0	1
<i>Phyllotreta striolata</i> (Fab.)		2	18	0
<i>Psylliodes napi</i> (Fabricius)		4	24	85
<i>Psylliodes punctulata</i> Melsheimer		1	1	0
<i>Pyrrhalta</i> sp.		1	1	0
<i>Scelolyperus cyanellus</i> (LeConte)		4	9	0
<i>Sumitrosis inaequalis</i> (Weber)		0	1	0
<i>Systema frontalis</i> (Fab.)		45	3	0
<i>Trirhabda borealis</i> Blake		1	0	0
<i>Trirhabda canadensis</i> (Kirby)		1	0	0
Unidentified		0	1	7
Cleroidea				
Unidentified		1	1	0
Cleridae				
<i>Necrobia</i> sp.		0	3	0

Order	Total catch		
Family			
Species	1979	1980	1981
Coccinellidae			
<i>Adalia bipunctata</i> L.	3	4	0
<i>Anatis quindecimpunctata</i> (Olivier)	0	2	0
<i>Brachyacantha ursina</i> (Fab.)	2	2	0
<i>Chilocorus stigma</i> (Say)	0	2	0
<i>Coccinella novemnotata</i> Herbst	0	20	3
<i>Coccinella transversoguttata</i>	690	520	38
<i>Coccinella trifasciata</i> L.	2	28	1
<i>Hippodamia parenthesis</i> (Say)	2	0	-
<i>Hippodamia tridecimpunctata tibialis</i> (Say)	77	335	5
<i>Hyperaspis</i> sp.	2	0	-
<i>Hyperaspis undulata</i> (Say)	0	10	-
<i>Hyperaspis uniformis</i>	1	0	-
<i>Mulsantina picta</i> (Randall)	43	36	-
<i>Psyllobora virgintimaculata</i> (Say)	0	12	1
<i>Scymnus</i> sp.	2	24	-
<i>Stethorus punctillum</i> WS	5	0	2
Larvae	63	-	-
Cryptophagidae			
<i>Anchicera</i> sp.	213	8	0
<i>Atomaria</i> sp.	13	4	0
Unidentified	2	8	0
Cucujidae			
Unidentified	2	3	0
Curculionidae			
<i>Acalles</i> sp.	3	0	0
<i>Anthonomus</i> sp.	1	0	0
Unidentified	1	0	1

Order	Total catch		
Family			
Species	1979	1980	1981
Barypithes sp.	0	4	-
Ceutorhynchus sp.	77	368	2
Grypus equiseti F.	0	4	12
Gymnaetron sp.	1	1	6
Hylobius sp.	0	62	14
Hypera sp.	0	1	-
Hyperodes sp.	36	13	-
Magdalis sp.	4	0	2
Microtrogus sp.	42	8	-
Otiorhynchus sp.	30	21	13
Philopedon sp.	28	21	5
Phyllobius sp.	1	1	8
Rhinoncus sp.	65	411	6
Sitona sp.	33	12	1
Trachyphloeus sp.	3	6	-
Tychius sp.	15	0	-
Dermestidae			
Unidentified	1	0	0
Dytiscidae			
Agabus sp.	0	1	8
Laccophilus sp.	1	0	0
Elateridae			
Agriotes sp.	3	1	0
Agriotes mancus (Say)	0	37	12
Agriotes sputator (L.)	92	1	17
Ctenicera sp. and Hypolithus sp.	292	476	6
Dalopius sp.	2	1,097	3
Hemicrepidius sp.	1	1	3

Order	Total catch		
Family			
Species	1979	1980	1981
Melanotus sp.	2	3	14
Negastrius sp.	7	33	0
Oestodes sp.	1	4	0
Unidentified	5	0	0
Elmidae			
Optioservus trivittatus (Brown)	1	0	0
Stenelmis sp.	2	0	0
Endomychidae			
Mycetina sp.	0	1	0
Erotylidae			
Triplax sp.	1	2	0
Helodidae			
Cyphon sp.	3	8	0
Heteroceridae			
Heterocerus sp.	0	6	0
Histeridae			
Unidentified	2	6	5
Hydrophilidae			
Anacaena limbata F.	19	17	0
Cercyon sp.	2	4	0
Cercyon analis Payk.	2	0	0
Cercyon quisquilius L.	1	0	0
Cymbiodyta sp.	0	20	1
Helophorus sp.	40	214	0
Helophorus grandis Ill.	15	48	19
Hydrobius fuscipes L.	3	13	1
Paracymus subcupreus Say	4	0	0

Order	Total catch		
Family			
Species	1979	1980	1981
Lagriidae			
Arthromacra aenea Say	0	2	0
Lampyridae			
Lucidota atra F.	3	0	1
Ellychnia corrusca L.	0	5	6
Lathridiidae			
Corticaria sp., Melanophthalma sp., others	324	83	9
Leiodidae	7	2	7
Limnebiidae			
Hydraena sp.	0	158	0
Melandryidae			
Emmesa labiata Say	0	8	0
Orchesia castanea Melsh	1	0	0
Meloidae			
Epicauta sp.	1	23	0
Lytta sp.	0	3	0
Melyridae			
Malachius sp.	0	2	0
Mordellidae			
Glipa sp. (?)	2	0	0
Mordella sp.	0	7	0
Unidentified	0	2	0
Nitidulidae			
Brachypterolus pulicarius (L.)	2	1	0
Colopterus sp.	0	1	0
Epuraea flavomaculata Maxlin	1	0	0
Glischrochilus quadrisignatus (Say)	765	883	792

Order	Total catch		
Family			
Species	1979	1980	1981
Meligethes sp.	78	2,231	6
Omosita colon (L.)	0	6	1
Oedemeridae			
Ditylus caeruleus (Rond.)	0	1	0
Nacerdes melanura (L.)	1	0	0
Orthoperidae			
Unidentified	2	0	0
Pedilidae			
Unidentified	1	1	0
Ptiliidae			
Unidentified	5	0	0
Ptinidae			
Ptinus sp.	0	29	0
Salpingidae			
Salpingus sp.	1	0	0
Scarabeidae			
Aphodius sp.	13	14	103
Aphodius distinctus Mull.	0	1	1
Aphodius erraticus L.	0	2	0
Dichelonyx subuittata Lec.	0	6	1
Diplotaxis tristus Kby.	3	2	23
Onthophagus nuchicornis L.	0	2	3
Trichiotinus assimilis (Kby.)	3	14	0
Unidentified	9	2	14
Scolytidae			
Dryocoetes sp.	17	3	0
Hylurgops sp.	0	3	1

Order	Total catch		
Family			
Species	1979	1980	1981
Hylurgopinus sp.	0	12	0
Polygraphus sp.	2	2	0
Scydmaenidae			
Euconnus sp.	0	1	0
Silphidae			
Nicrophorus sp.	2	27	7
Oiceptoma novaboracensis Forst.	0	4	0
Silpha surinamensis Fab.	0	1	0
Staphylinidae			
Acylophorus sp.	55	225	24
Aleochara sp.	1	0	3
Aleocharinae s. fam.	49	48	1
Erichsonius sp.	2,031	1,432	109
Eusphalerum sp.	14	22	0
Hypnogyus hamatus Say	86	417	932
Ontholestes cingulatus Grav.	1	0	0
Oxytelus sp.	2	0	9
Philonthus sp.	2,302	1,767	1,084
Philonthus cyanipennis Fab.	4	0	0
Platystethus sp.	19	20	1
Tachinus sp.	1	2	2
Tachinus limbatus Melsh	21	67	0
Tachyporus sp.	71	64	1
Tachyporus nitidulus (Fab.)	5	5	0
Staphylinus badipes Lec.	8	8	303
Throscidae			
Throscus sp.	23	90	0
Aulanothroscus sp.	9	1	0

Order	Total catch		
Family			
Species	1979	1980	1981
Coleoptera larvae	157	1,254	1,089
Mecoptera	5	5	0
Trichoptera	93	1	1
Lepidoptera	646	984	-
Diptera			
Nematocera	44,011	16,347	2,674
Brachycera			
Asilidae			
Asilus sp.	-	81	0
Laphria sp.	-	8	0
Laphria sadales Walker	-	1	0
Neoitamus orphne (Walker)	-	1	0
Unidentified spp.	472	24	0
Dolichopodidae			
Condylostylus nigrofemoratus (Walk.)	100	925	0
Condylostylus sp. or spp.	186	516	0
Chrysotus sp. or spp.	152	757	0
Dolichopus sp.	0	103	0
Dolichopus spp.	127	2,676	0
Dolichopus cuprinus Wied.	0	147	0
Dolichopus gratus Lw.	0	6	0
Medetera spp.	180	5	2
Thrypticus sp.	83	0	0
Tabanidae			
Chrysops ater MacQ.	32	2	-
Chrysops excitans Walk.	8	17	-

Order	Total catch		
Family			
Species	1979	1980	1981
<i>Chrysops furcatus</i> Walk.	0	2	-
<i>Chrysops mitis</i> O.S.	40	3	-
<i>Hybomitra affinis</i> (Kirby)	1	22	-
<i>Hybomitra epistates</i> O.S.	1	0	-
<i>Hybomitra illota</i> (O.S.)	0	2	-
<i>Hybomitra lasiophthalma</i> (MacQ.)	25	9	-
<i>Hybomitra zonalis</i> (Kirby)	0	1	-
<i>Chetogena</i> sp.	81	99	-
<i>Cryptomeigenia simplex</i> Curran			
<i>Euexorista futilis</i> (O.S.)			
<i>Euexorista mella</i> (Wlk.)			
<i>Eulasiona comstocki</i> Tns.			
<i>Oswaldia assimilis</i> (Tns.)			
<i>Phryxe</i> sp.			
<i>Ptilodexia</i> sp.			
<i>Voria ruralis</i> (Fallén)			
<i>Winthemia fumiiferanae</i> Tothill			
Cyclorrhapha			
Anthomyiidae			
<i>Hylemya alcathoe</i> Walker	14	6	0
Calliphoridae			
<i>Cynomopsis cadaverina</i> (R.D.)	90	-	0
<i>Phormia regina</i> (Meig.)	14	-	0
<i>Pollenia rudis</i> (Fab.)	502	-	0
Muscidae			
<i>Musca autumnalis</i>	50	-	0
<i>Musca domestica</i> Linne	14	-	0
<i>Ophyra aenescens</i> Wied.	1	-	0

Order	Total catch		
Family			
Species	1979	1980	1981
Sarcophagidae			
<i>Agria housei</i> Shewell and <i>Ravinia latisetosa</i> Park.	756	-	-
<i>Bellieria melanura</i> (Mg.)	286	-	-
<i>Helicobia rapax</i> (Walk.)	5	-	-
<i>Ravinia</i> sp.	53	-	-
<i>Ravinia querula</i> (Walk.)	248	-	-
<i>Sarcophaga aldrichi</i> Park.	136	-	-
<i>Sarcophaga nearctica</i> Park.	25	-	-
<i>Sarcophaga sinuata</i> Mg.	15	-	-
Scatophagidae			
<i>Scatophaga stercoraria</i> (L.)	18	1	-
Syrphidae			
<i>Carposcalis obscurus</i> (Say)	31	0	0
<i>Chalcosyrphus vecors</i> O.S.	0	3	0
<i>Cheilosia</i> sp.	0	2	0
<i>Eristalis</i> sp.	2	11	0
<i>Eristalis arbustorum</i> (L.)	5	33	0
<i>Eumerus strigatus</i> (Fallen)	425	400	0
<i>Helophilus fasciatus</i> Walk.	2	1	0
<i>Melanostoma</i> sp.	15	0	0
<i>Metasyrphus americanus</i> (Wd.)	0	1	0
<i>Metasyrphus perplexus</i> (Osb.)	0	1	0
<i>Parasyrphus</i> sp.	0	1	0
<i>Platycheirus</i> spp.	26	13	0
<i>Platycheirus scambus</i> Staeg.	0	5	0
<i>Polydontomyia curvipes</i> (Wied.)	1	2	0
<i>Sericomyia militaris</i> Walk.	0	2	0

Order	Total catch		
Family			
Species	1979	1980	1981
Sphaerophoria sp. or spp.	0	24	0
Sphaerophoria philanthus (Mg.)	138	612	2
Syritta pipiens (L.)	1	2	0
Syrphus ribesii (L.)	9	6	0
Syrphus torvus O.S.	0	31	0
Temnostoma sp.	2	14	0
Temnostoma alternans Lw.	0	4	0
Toxomerus germinatus (Say)	27	93	0
Tropidia quadrata (Say)	22	37	0
Xylota sp.	0	2	0
Xylota segnis (L.)	12	40	0
Xylota subfasciata Lw.	0	4	0
Unidentified sp.	5	0	0
Unidentified	34,286	59,843	5,018
Larvae	177	9	134
Hymenoptera			
Braconidae			
Braconinae			
Bracon sp.	18	8	0
Helconinae			
Helcon sp.	23	1	0
Euphorinae			
Dinocampus coccinellae	3	2	0
Meteorus sp.	6	8	0
Peristenus sp.	17	6	0
Syntretus sp.	23	8	0
Macrocentrinae			
Macrocentrus sp.	33	0	0

Order	Total catch		
	Family		
Species	1979	1980	1981
Microgastrinae			
Apanteles sp.	23	1	0
Microplitis sp.	71	14	0
Opiinae			
Opius sp.	1	0	109
Sigalphinae			
Chelonus sp.	25	0	0
Ichneumonidae			
Anomaloninae			
Therion sp.	1	0	78
Trichionotus sp. (Agrypon sp.)	2	0	0
Banchinae			
Lissonota acrobasidis Ashmead	13	2	0
Banchus flavescens Cresson	1	1	0
Lissonota laevigata Cresson	8	0	0
Campopleginae			
Enytus sp.	6	48	0
Campoplegini sp.	0	14	4
Diadegma sp.	13	0	0
Cryptinae			
Gelis sp.	9	197	0
Medophron sp.	43	642	0
Atractodes sp.	99	106	0
Cryptus albitarsis (Cress.)	1	0	0
Dichrogaster crassa (Prov.)	3	3	0
Endasys sp.	76	110	0
Hemiteles sp.	84	203	0
Mastrus sp.	2	27	0

Order	Total catch		
Family			
Species	1979	1980	1981
Phygadeuon sp.	12	225	0
Polytribax crotchii (Cress.)	2	0	0
Pycnocyrtus director (Thbg.)	33	0	0
Trychosis sp.	0	1	0
Diplazontinae			
Diplazon laetatorius Fab.	5	0	0
Homotropus sp.	0	5	0
Ichneumoninae			
Phaeogenes cacoeciae Vier.	29	16	0
Phaeogenes hariolus (Cresson)	0	23	0
Vulgichneumon brevicinctus (Say)	3	0	0
Exephanes terminalis (Prov.)	34	0	0
Centeterus sp.	0	1	0
Cratichneumon pilosulus (Prov.)	1	0	0
Cratichneumon sp.	0	1	0
Diphyus sp.	4	0	0
Ichneumon sp.	0	1	0
Ichneumon versabilis Cress.	2	0	0
Ischnus inquisitorius atricollaris (Walsh)	1	1	0
Labeninae			
Eclytus sp.	9	8	0
Mesocharinae			
Mesochorus sp.	4	0	0
Ophioninae			
Enicospilus sp.	8	19	0
Pimplinae			
Pimpla tenuicornis (Cress.)	7	0	0
Scambus (Scambus) canadensis Walley	5	0	0

Order	Total catch		
Family			
Species	1979	1980	1981
Xoridinae			
Odontocolon sp.	1	0	0
Orthocentrinae			
Stenomacrus sp.	0	1	0
Unidentified spp.	51	6	0
Chalcidoidea			
Encyrtidae			
Coccidencytrus sp.	27	14	0
Copidosoma sp.	554	7	0
Discodes sp.	4	2	0
Encarsia sp.	9	0	0
Encyrtus sp.	4	0	0
Microterys sp.	42	18	0
Eulophidae			
Chrysocharis malaenis (Walker)	22	2	0
Chrysonotomyia formosa (Westwood)	9	0	0
Cirrospilus sp.	10	47	0
Omphale sp.	55	23	0
Pnigalio sp.	2	0	0
Tetrastichus sp.	154	13	0
Eurytomidae			
Eudecatoma sp.	9	0	0
Eurytoma sp.	71	34	0
Harmolita sp.	359	186	0
Miscogasteridae			
Cyrtogaster sp.	0	2	0
Mymaridae			
Gonatocerus sp.	90	19	0

Order	Total catch		
Family			
Species	1979	1980	1981
Mymar sp.	2	0	0
Polynema sp.	380	29	0
Pteromalidae			
Asaphes vulgaris Walker	134	3	0
Halticoptera sp.	100	7	0
Homoporus sp.	8	4	0
Gastracanthus sp.	21	4	0
Gastracancistrus sp.	2	1	4
Lamprotatus sp.	75	12	0
Sceptrothelys sp.	11	8	0
Seladerma sp.	28	13	0
Spalangia sp.	24	3	0
Torymidae			
Megastigma sp.	3	8	0
Torymus sp.	36	8	0
Trichogrammatidae			
Aphelinoidea sp.	84	0	0
Cynipoidea			
Alloxystidae			
Alloxysta sp.	114	4	0
Eucoilidae			
Kleidotoma sp.	14	14	0
Pseudoeucoila sp.	84	2	0
Trybliographa sp.	6	1	0
Figitidae			
Xyalophora sp.	3	5	0
Cynipidae			
?Saphonecrus sp.	10	2	0

Order	Total catch		
Family			
Species	1979	1980	1981
Proctotrupoidea			
Diapriidae			
Aneurhynchus sp.	29	1	0
Basalys sp.	17	0	0
Belyta sp.	36	308	0
Idiotypa sp.	1	0	0
Miota sp.	399	1,239	0
Polypeza sp.	16	3	0
Psilus sp.	11	1	0
Spilomicrus sp.	2	2	0
Trichopria sp.	2,151	463	0
Zygota sp.	17	0	0
Platygastridae			
Inostemma sp.	31	1	0
Leptacis sp.	52	5	0
Metaclisis sp.	31	6	0
Platygaster sp.	87	101	0
Synopeas sp.	206	102	0
Proctotrupidae			
Codrus sp.	16	3	0
Scelionidae			
Asolcus sp.	55	0	0
Telenomus sp.	213	359	0
Telenomus podisi Ashmead	122	125	0
Trimorus sp.	196	23	0
Unidentified	165	2	0
Sundholmiella sp.	8	15	0

Order	Total catch			
	Family			
	Species	1979	1980	1981
Bethyloidea				
Bethylidae				
Pseudisobrachium sp.	4	0	0	
Chrysididae				
Omalus sp.	37	1	0	
Dryinidae				
Anteon sp.	36	5	0	
Aphelopus so.	2	13	0	
Unidentified spp.	14	20	0	
Ceraphronoidea				
Ceraphronidae				
Aphanogmus sp.	265	2	0	
Ceraphron sp.	382	90	0	
Megaspilidae				
Dendrocercus sp.	872	38	0	
Dendrocercus niger (How.)	1	1	0	
Sphecoidea				
Sphécidae				
Pemphredon sp.	36	0		
Craproninae				
Lesticas sp.	14	3	0	
Pemphredoninae				
Mimesa sp.	9	13	0	
Passaloecus sp.	16	10	0	
Trypoxyloninae				
Trypoxylon sp.	4	1	0	
Crabroninae				
Ectemnius sp.	2	5	0	

Order	Total catch		
Family			
Species	1979	1980	1981
<i>Crissocerus</i> sp.	41	6	0
Gorytinae			
<i>Ochleroptera bipunctata</i> (Say)	12	7	0
Nyssoninae			
<i>Nysson</i> sp.	10	0	0
Unidentified	-	-	1,271
Apoidea			
Halictidae			
<i>Lasioglossum athabascense</i> Sand.	19	-	-
Halictinae			
<i>Dialictus</i> sp.	123	-	-
<i>Halictus</i> sp.	51	-	-
<i>Halictus confusus</i> Smith	248	-	-
<i>Sphecodes</i> sp.	1	-	-
Andrenidae			
Panurginae			
<i>Perdita octomaculata</i> (Say)	1	-	-
Andreninae			
<i>Andrena</i> sp.	24	-	-
Aphidae			
Apinae			
<i>Apis mellifera</i> L.	11	-	-
Bombinae			
<i>Bombus</i> sp.	15	-	-
Collectidae			
Hylaeinae			
<i>Hylaeus</i> sp.	23	0	-
Unidentified	451	1,709	-

Order	Total catch		
Family			
Species	1979	1980	1981
Formicoidea			
Formicidae	2,227	2,507	3,147
Vespoidea			12
Eumenidae			
Eumeninae			
Odynerus sp.	1	1	-
Vespidae			
Vespinae			
Vespula (Dolichovespula) arenaria F.	23	23	-
Vespula (V.) consobrina (Sauss.)	0	7	-
Vespula (Dolichovespula) maculata (L.)	0	2	-
Unidentified	49	46	-
Bethyloidea			
Chrysididae			
Chrysididinae			
Chrysis sp.	1	2	-
Unidentified sp.	0	2	-
Pompiloidea			
Pompilidae			
Pepsinae			
Priocnemis germana (Cresson)	1	0	-
Tenthredinidae	355	2,653	169
Scolioidea	0	0	10

¹Number of samples in which they were present.

²No data.

SEASONAL ABUNDANCE OF ARTHROPODS

The following table contains data on the seasonal abundance of selected groups of potato arthropods for 1979, 1980 and 1981 and for each sampling method. Years when groups were present in less than five sampling dates have not been included. Figures refer to the average number of arthropods per pitfall trap, yellow water pan, 50 sweeps or one ground cloth in positive samples. The number of positive samples (number of fields with at least one arthropod) is given in brackets. Sampling started around the first of June and ended at topkill or in September.

Arachnida

Day	Pitfall			Yellow pan		
	1979	1980	1981	1979	1980	1981
150	0 (0)	0 (0)	-	0 (0)	0 (0)	-
154	0 (0)	5.74(7)	6.8 (5)	0 (0)	2.67(24)	0.75(2)
157	0 (0)	0 (0)	-	0.5 (1)	1.20(18)	-
161	0.70(2)	3.23(9)	6.13(13)	1.47(17)	1.42(24)	2.5 (1)
164	1.34(5)	3.17(4)	-	0.92(6)	1.19(16)	-
168	1.61(8)	4.24(9)	4.71(14)	1.04(12)	1.24(21)	1.0 (1)
171	1.93(4)	2.44(5)	-	1.0 (2)	1.16(19)	-
175	3.04(13)	6.87(6)	5.14(12)	0.75(4)	1.48(20)	0.75(6)
178	1.45(9)	3.62(6)	-	0.50(1)	1.52(26)	-
182	2.44(9)	0 (0)	3.19(14)	1.5 (3)	0.90(5)	0.75(2)
185	2.0 (14)	3.55(14)	-	0.70(5)	1.0 (9)	-
189	1.3 (15)	5.02(10)	3.89(15)	0.64(7)	1.4 (5)	0.75(2)
192	1.38(8)	2.44(13)	-	0.5 (2)	0.71(7)	-
196	1.44(9)	1.62(9)	3.35(13)	0 (0)	0.59(11)	0.50(1)
199	3.62(12)	1.32(8)	-	1.25(2)	0.75(8)	-
203	1.58(16)	3.83(9)	2.44(13)	0.57(7)	0.69(8)	0 (0)
206	2.46(8)	1.23(9)	-	0 (0)	0.57(7)	-
210	2.24(16)	4.26(11)	1.66(9)	0.67(3)	0.50(2)	0 (0)
213	2.15(6)	1.36(9)	-	1.0 (1)	0.75(2)	-
217	1.41(12)	2.2 (2)	1.24(6)	0.75(2)	0 (0)	0 (0)
220	8.66(8)	1.89(16)	-	0.5 (3)	0.58(6)	-
224	0.48(5)	3.18(9)	1.65(2)	0 (0)	0.50(3)	0.50(1)
227	1.08(7)	0.72(9)	-	0.5 (2)	0.50(2)	-
231	0.69(9)	4.07(9)	1.15(4)	1.0 (3)	0.50(2)	0 (0)
234	1.85(8)	0.68(9)	-	1.0 (3)	0 (0)	-
238	1.5 (8)	3.53(7)	0.5 (2)	0.75(4)	0 (0)	-
241	4.39(6)	0.69(6)	-	1.17(3)	1.00(1)	-
245	0.5 (1)	0.50(1)	1.2 (2)	0 (0)	-	-
248	4.65(6)	-	-	0.5 (1)	-	-
252	6.09(2)	-	-	0 (0)	-	-
255	3.47(3)	-	-	0 (0)	-	-
259	0 (0)	-	-	0.5 (1)	-	-

Day	Arachnida			
	Sweepnet		Ground cloth	
	1979	1980	1979	1980
150	-	-	-	-
154	-	-	-	-
157	-	-	-	-
161	-	-	-	-
164	-	-	-	-
168	-	-	-	-
171	-	-	-	-
175	-	-	-	-
178	-	0.25(1)	-	0 (0)
182	-	-	-	-
185	0 (0)	0.29(5)	0 (0)	0.50(1)
189	-	-	-	-
192	0.56(4)	0.37(6)	0.33(3)	0.50(2)
196	-	-	-	-
199	0.28(8)	0.57(7)	0.44(4)	0.33(6)
203	-	-	-	-
206	0.42(6)	0.25(3)	0.25(3)	0.25(1)
210	-	-	-	-
213	0.72(9)	0.38(4)	0.63(2)	0.33(3)
217	-	-	-	-
220	0.45(13)	0.32(8)	0.53(11)	0.25(4)
224	-	-	-	-
227	0.25(4)	0.25(4)	0.44(4)	0.25(2)
231	-	-	-	-
234	0.75(4)	0.31(4)	0.33(3)	0.25(1)
238	-	-	-	-
241	0.63(3)	0 (0)	0.75(1)	0 (0)
245	-	-	-	-
248	0.25(1)	-	0.25(1)	-
252	-	-	-	-
255	0 (0)	-	0 (0)	-
259	-	-	-	-

Aphididae

Day	Pitfall			Yellow pan		
	1979	1980	1981	1979	1980	1981
150	0 (0)	0 (0)	-	22.00(3)	0	-
154	0 (0)	.10(1)	0 (0)	0 (0)	1.13(4)	0 (0)
157	0 (0)	0 (0)	-	0 (0)	1.36(7)	-
161	0 (0)	0 (0)	0 (0)	5.83(24)	3.82(19)	.75(2)
164	2.27(3)	.18(7)	-	2.80(10)	1.83(27)	-
168	0 (0)	.20(3)	0 (0)	6.12(25)	6.62(30)	4.25(2)
171	.80(2)	0 (0)	-	26.00(4)	15.10(43)	-
175	.85(2)	.18(4)	.20(4)	4.53(28)	22.67(36)	1.42(6)
178	.60(6)	1.55(4)	-	5.57(7)	51.00(45)	-
182	.57(3)	0 (0)	.27(3)	6.59(22)	18.32(11)	4.42(6)
185	.59(9)	.33(4)	-	50.81(21)	27.27(28)	-
189	.46(9)	.64(5)	.68(7)	5.46(34)	16.75(39)	10.75(6)
192	3.78(7)	.32(9)	-	33.50(4)	16.04(50)	-
196	.48(6)	.10(2)	3.34(7)	21.96(33)	16.27(31)	.50(1)
199	.92(9)	.10(1)	-	21.90(5)	40.34(37)	-
203	1.10(9)	.50(4)	6.81(10)	22.49(37)	40.52(35)	40.00(4)
206	2.53(8)	.94(5)	-	20.50(3)	53.32(39)	-
210	1.10(15)	2.7 (6)	2.0 (2)	34.67(36)	59.19(34)	11.17(6)
213	1.58(6)	4.3 (6)	-	42.00(3)	35.05(31)	-
217	2.60(10)	2.4 (1)	0 (0)	35.73(32)	14.00(1)	17.75(2)
220	1.39(11)	1.57(10)	-	29.01(8)	41.58(48)	-
224	.34(5)	2.0 (2)	7.6 (1)	19.40(21)	27.98(63)	5.67(3)
227	9.91(4)	2.05(2)	-	13.68(11)	19.22(45)	-
231	2.10(8)	1.80(3)	3.6 (1)	24.45(22)	19.15(37)	0 (0)
234	.84(7)	0 (0)	-	9.11(18)	8.89(35)	-
238	10.33(4)	0 (0)	0 (0)	18.57(27)	5.27(28)	0 (0)
241	.20(1)	0 (0)	-	10.25(8)	0 (0)	-
245	0 (0)	0 (0)	0 (0)	0 (0)	-	-
248	.6 (2)	-	-	7.88(4)	-	-
252	0 (0)	-	-	4.00(3)	-	-
255	.20(1)	-	-	6.33(3)	-	-
259	0 (0)	-	-	1.00(2)	-	-

Day	Aphididae			
	Sweepnet		Ground cloth	
	1979	1980	1979	1980
150	-	-	-	-
154	-	-	-	-
157	-	-	-	-
161	-	-	-	-
164	-	-	-	-
168	-	-	-	-
171	-	-	-	-
175	-	-	-	-
178	-	1.00(2)	-	0 (0)
182	-	-	-	-
185	1.00(1)	.30(5)	2.75(1)	1.13(2)
189	-	-	-	-
192	22.88(4)	1.06(4)	24.78(8)	4.68(7)
196	-	-	-	-
199	4.61(17)	11.03(16)	21.69(17)	9.54(13)
203	-	-	-	-
206	9.27(19)	21.46(6)	4.99(16)	77.83(3)
210	-	-	-	-
213	8.12(22)	13.90(15)	36.38(12)	23.58(17)
217	-	-	-	-
220	14.25(34)	11.00(7)	22.15(37)	40.13(19)
224	-	-	-	-
227	.95(5)	6.03(8)	2.79(6)	3.50(12)
231	-	-	-	-
234	3.86(9)	8.97(10)	11.53(8)	.50(7)
238	-	-	-	-
241	1.25(2)	0 (0)	.63(3)	160.00(1)
245	-	-	-	-
248	1.67(3)	-	1.67(3)	-
252	-	-	-	-
255	6.00(1)	-	2.00(1)	-
259	-	-	-	-

Cercopidae

Day	Pitfall		Yellow pans		Sweepnet	
	1979	1980	1979	1980	1979	1980
150	0 (0)	0 (0)	6.50(1)	0 (0)	-	-
154	0 (0)	.15(2)	0 (0)	1.63(12)	-	-
157	0 (0)	0 (0)	0 (0)	.90(5)	-	-
161	0 (0)	.13(3)	1.75(2)	1.56(8)	-	-
164	.25(2)	0 (0)	.67(3)	1.71(7)	-	-
168	.17(3)	.60(1)	1.13(15)	.63(4)	-	-
171	0 (0)	0 (0)	2.00(2)	.75(2)	-	-
175	.35(2)	0 (0)	.96(13)	.50(1)	-	-
178	0 (0)	0 (0)	2.50(3)	.75(4)	-	0 (0)
182	0 (0)	0 (0)	.79(7)	0 (0)	-	-
185	.1 (1)	0 (0)	.88(8)	0 (0)	0 (0)	0 (0)
189	0 (0)	0 (0)	.73(13)	0 (0)	-	-
192	0 (0)	0 (0)	.50(1)	0 (0)	.25(2)	0 (0)
196	0 (0)	0 (0)	1.89(14)	0 (0)	-	-
199	0 (0)	.10(1)	.75(2)	1.13(4)	6.60(13)	1.00(1)
203	.1 (1)	0 (0)	2.03(37)	1.09(18)	-	-
206	.15(2)	.10(1)	1.00(1)	1.28(16)	1.13(14)	0 (0)
210	0 (0)	0 (0)	2.10(21)	4.32(28)	-	-
213	.1 (2)	.45(2)	1.0 (2)	2.00(39)	.63(15)	1.20(14)
217	0 (0)	1.8 (1)	1.66(19)	1.00(1)	-	-
220	0 (0)	.36(5)	2.25(4)	3.29(40)	1.01(23)	1.06(12)
224	0 (0)	0 (0)	1.40(5)	2.13(42)	-	-
227	0 (0)	1.10(2)	.83(3)	1.05(21)	0 (0)	2.39(11)
231	0 (0)	.94(5)	.86(11)	1.96(10)	-	-
234	0 (0)	.93(3)	1.88(4)	1.09(16)	.25(1)	1.05(10)
238	.10(2)	0 (0)	.95(11)	1.75(16)	-	-
241	.08(2)	.20(1)	2.0 (2)	1.40(15)	.75(1)	1.63(2)
245	0 (0)	0 (0)	0 (0)	-	-	-
248	0 (0)	-	1.50(2)	-	.50(2)	-
252	0 (0)	-	.50(1)	-	-	-
255	0 (0)	-	.50(1)	-	0 (0)	-
259	0 (0)	-	0 (0)	-	-	-

Cicadellidae

Day	Pitfall				Yellow pan				Sweepnet			
	1979		1980		1979		1980		1979		1980	
150	0	(0)	0	(0)	5.00(1)	0	(0)		-		-	
154	0	(0)	.10	(2)	0	(0)	1.82	(19)	-		-	
157	0	(0)	0	(0)	0	(0)	2.72	(9)	-		-	
161	.20	(1)	.10	(2)	1.09	(11)	1.22	(21)	-		-	
164	.27	(3)	.10	(1)	0	(0)	2.17	(3)	-		-	
168	1.63	(4)	0	(0)	2.47	(15)	.50	(3)	-		-	
171	.15	(2)	.20	(1)	2.67	(3)	1.87	(8)	-		-	
175	.53	(10)	.60	(1)	2.48	(19)	1.47	(16)	-		-	
178	.38	(6)	.6	(2)	1.70	(5)	2.58	(31)	-		.88	(2)
182	.55	(10)	0	(0)	1.73	(11)	.50	(1)	-		-	
185	.53	(8)	.33	(3)	1.85	(17)	1.29	(22)	.25	(1)	0	(0)
189	.81	(10)	.55	(6)	1.72	(23)	1.82	(25)	-		-	
192	.53	(6)	.20	(4)	4.5	(3)	2.47	(30)	.42	(3)	1.55	(5)
196	.36	(7)	.28	(4)	1.97	(15)	1.38	(13)	-		-	
199	.87	(4)	.57	(6)	2.00	(2)	2.98	(23)	.40	(10)	.44	(8)
203	.62	(6)	1.20	(6)	2.52	(21)	1.73	(28)	-		-	
206	.35	(6)	.36	(8)	1.75	(2)	1.73	(21)	.53	(7)	0	(0)
210	.52	(10)	6.87	(3)	2.64	(11)	1.82	(22)	-		-	
213	0	(0)	.42	(6)	.50	(1)	2.27	(19)	.76	(8)	.95	(9)
217	1.04	(7)	1.00	(1)	1.18	(20)	.50	(1)	-		-	
220	.40	(6)	1.18	(8)	3.75	(4)	1.84	(28)	1.26	(23)	.61	(9)
224	.25	(2)	1.88	(5)	2.31	(8)	1.09	(33)	-		-	
227	.15	(3)	.46	(5)	1.50	(1)	1.05	(21)	2.50	(5)	.38	(4)
231	1.06	(7)	.40	(2)	3.04	(12)	1.07	(14)	-		-	
234	.28	(8)	.87	(3)	1.07	(15)	2.40	(29)	.65	(5)	.35	(8)
238	.20	(3)	.91	(7)	3.58	(20)	1.86	(18)	-		-	
241	.18	(2)	.57	(9)	3.25	(6)	1.15	(13)	2.09	(3)	2.25	(1)
245	0	(0)	.30	(1)	0	(0)	-		-		-	
248	0	(0)	-		1.13	(4)	-		.85	(5)	-	
252	0	(0)	-		.50	(1)	-		-		-	
255	.20	(1)	-		2.25	(2)	-		0	(0)	-	
259	0	(0)	-		0	(0)	-		-		-	

Day	Cicadellidae		Membracidae		Miridae			
	Ground cloth		Yellow pan		Pitfall			
	1979	1980	1979	1980	1979	1980		
150	-	-	.50(1)	0 (0)	0 (0)	0 (0)	0 (0)	
154	-	-	0 (0)	.79(7)	0 (0)	0 (0)	0 (0)	
157	-	-	0 (0)	1.00(1)	0 (0)	0 (0)	0 (0)	
161	-	-	.50(1)	.50(4)	0 (0)	0 (0)	0 (0)	
164	-	-	0 (0)	1.00(1)	0 (0)	0 (0)	0 (0)	
168	-	-	.50(1)	.50(1)	0 (0)	0 (0)	0 (0)	
171	-	-	0 (0)	.50(1)	.20(1)	0 (0)	0 (0)	
175	-	-	0 (0)	.50(1)	0 (0)	0 (0)	0 (0)	
178	-	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
182	-	-	0 (0)	0 (0)	.10(2)	0 (0)	0 (0)	
185	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
189	-	-	0 (0)	0 (0)	.10(1)	0 (0)	0 (0)	
192	0 (0)	.25(1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
196	-	-	0 (0)	0 (0)	.10(1)	0 (0)	0 (0)	
199	.50(2)	.38(2)	0 (0)	0 (0)	.20(1)	.13(3)		
203	-	-	.50(1)	0 (0)	.10(3)	1.2 (2)		
206	.25(1)	0 (0)	0 (0)	0 (0)	.40(2)	.20(1)		
210	-	-	1.17(6)	1.00(3)	.13(3)	0 (0)		
213	.25(2)	.25(2)	0 (0)	.50(1)	.15(2)	.15(2)		
217	-	-	.61(9)	0 (0)	.20(1)	0 (0)		
220	.50(8)	.25(1)	.90(5)	.92(6)	0 (0)	0 (0)		
224	-	-	.67(6)	.54(13)	.10(1)	0 (0)		
227	.25(2)	0 (0)	.67(3)	.75(8)	0 (0)	0 (0)		
231	-	-	1.00(1)	.89(9)	.13(3)	.40(1)		
234	.94(4)	.38(3)	1.08(6)	1.21(14)	0 (0)	0 (0)		
238	-	-	1.07(7)	1.00(14)	0 (0)	0 (0)		
241	.25(1)	0 (0)	1.50(3)	1.72(9)	0 (0)	0 (0)		
245	-	-	0 (0)	-	0 (0)	0 (0)		
248	.50(2)	-	1.00(2)	-	0 (0)	-		
252	-	-	0 (0)	-	0 (0)	-		
255	0 (0)	-	.75(2)	-	0 (0)	-		
259	-	-	0 (0)	-	0 (0)	-		

Miridae

Day	Yellow pan		Sweepnet		Ground cloth	
	1979	1980	1978	1980	1979	1980
150	2.00(1)	0 (0)	-	-		
154	0 (0)	0 (0)	-	-		
157	0 (0)	0 (0)	-	-		
161	5.50(1)	0 (0)	-	-		
164	0 (0)	0 (0)	-	-		
168	0 (0)	0 (0)	-	-		
171	0 (0)	0 (0)	-	-		
175	.50(1)	0 (0)	-	-		
178	0 (0)	1.00(3)	-	0 (0)		0 (0)
182	.67(3)	0 (0)	-	-		-
185	.50(3)	.50(1)	.50(1)	0 (0)	0 (0)	0 (0)
189	.81(8)	.50(2)	-	-	-	-
192	.75(2)	0 (0)	.57(7)	.88(2)	.75(2)	.25(1)
196	.97(17)	.50(1)	-	-	-	-
199	0 (0)	.71(7)	1.42(23)	1.31(12)	1.00(14)	.25(1)
203	1.10(14)	.40(5)	-	-	-	-
206	.50(2)	.92(6)	1.02(21)	.25(2)	.30(5)	0 (0)
210	.73(11)	1.00(5)	-	-	-	-
213	.50(1)	.67(3)	1.25(20)	1.25(3)	.45(5)	.25(1)
217	.78(9)	0 (0)	-	-	-	-
220	1.00(3)	.50(5)	2.65(29)	1.15(5)	.88(21)	.50(1)
224	1.50(3)	2.50(1)	-	-	-	-
227	1.25(2)	.50(1)	.34(3)	.75(6)	.25(2)	.25(1)
231	.86(7)	0 (0)	-	-	-	-
234	.50(3)	0 (0)	1.25(1)	.69(8)	.70(5)	.25(1)
238	.75(6)	0 (0)	-	-	-	-
241	.75(2)	0 (0)	1.42(5)	1.67(3)	0 (0)	0 (0)
245	0 (0)	-	-	-	-	-
248	0 (0)	-	.70(5)	-	1.25(2)	-
252	.50(2)	-	-	-	-	-
255	.50(2)	-	1.00(1)	-	.50(1)	-
259	0 (0)	-	-	-	-	-

Nabidae								
Day	Pitfall				Yellow pan		Sweepnet	
	1979		1980		1980		1979	1980
150	0	(0)	0	(0)	0	(0)	-	-
154	0	(0)	0	(0)	0	(0)	-	-
157	0	(0)	0	(0)	.50	(2)	-	-
161	0	(0)	0	(0)	.50	(1)	-	-
164	0	(0)	.10	(1)	.50	(1)	-	-
168	.10	(1)	0	(0)	0	(0)	-	-
171	.20	(1)	0	(0)	0	(0)	-	-
175	0	(0)	0	(0)	0	(0)	-	-
178	0	(0)	0	(0)	0	(0)	-	0 (0)
182	.20	(1)	0	(0)	0	(0)	-	-
185	.15	(2)	0	(0)	0	(0)	0 (0)	0 (0)
189	.13	(3)	0	(0)	.50	(1)	-	-
192	.20	(1)	.10	(1)	0	(0)	0 (0)	.50(1)
196	.15	(2)	0	(0)	0	(0)	-	-
199	.13	(2)	0	(0)	.50	(2)	.25(2)	.50(1)
203	.15	(2)	0	(0)	1.00	(1)	-	-
206	0	(0)	.20	(2)	0	(0)	0 (0)	.25(1)
210	.08	(2)	0	(0)	0	(0)	-	-
213	0	(0)	0	(0)	.50	(1)	.25(2)	.25(5)
217	0	(0)	0	(0)	0	(0)	-	-
220	.10	(1)	.10	(2)	0	(0)	.34(3)	.42(3)
224	0	(0)	0	(0)	0	(0)	-	-
227	0	(0)	0	(0)	0	(0)	0 (0)	.33(3)
231	0	(0)	0	(0)	0	(0)	-	-
234	0	(0)	0	(0)	0	(0)	0 (0)	.25(3)
238	0	(0)	0	(0)	0	(0)	-	-
241	0	(0)	.20	(1)	0	(0)	.63(2)	.25(1)
245	0	(0)	0	(0)	-		-	
248	0	(0)	-		-		.25(1)	
252	0	(0)	-		-		-	
255	0	(0)	-		-		0 (0)	
259	0	(0)	-		-		-	

Pentatomidae								
Day	Pitfall		Yellow pan		Sweepnet	Ground cloth		
	1980		1979	1980	1979	1979		
150	0	(0)	0	(0)	0	(0)	-	-
154	0	(0)	0	(0)	0	(0)	-	-
157	0	(0)	0	(0)	0	(0)	-	-
161	0	(0)	0	(0)	.50(2)	-	-	-
164	0	(0)	0	(0)	0	(0)	-	-
168	0	(0)	.63(4)	1.00(3)	-	-	-	-
171	0	(0)	0	(0)	.50(1)	-	-	-
175	0	(0)	.50(1)	.83(3)	-	-	-	-
178	0	(0)	0	(0)	1.25(4)	-	-	-
182	0	(0)	0	(0)	0	(0)	-	-
185	.20(1)		0	(1)	1.00(2)	0	(0)	.50(1)
189	2.43(3)		.50(1)	.50(1)	-	-	-	-
192	.85(2)		0	(0)	2.00(1)	.67(3)	-	.50(2)
196	0	(0)	.50(1)	1.50(1)	-	-	-	-
199	0	(0)	0	(0)	1.25(2)	.75(1)	-	.25(1)
203	.10(1)		0	(0)	.67(3)	-	-	-
206	.30(2)		0	(0)	.50(1)	.38(2)	-	.25(2)
210	0	(0)	0	(0)	2.00(3)	-	-	-
213	0	(0)	0	(0)	0	(0)	.25(3)	.33(3)
217	0	(0)	0	(0)	0	(0)	-	-
220	.10(1)		0	(0)	.75(2)	3.82(14)	-	1.46(16)
224	0	(0)	0	(0)	.50(1)	-	-	-
227	0	(0)	0	(0)	0	(0)	.75(4)	.25(2)
231	.40(1)		0	(0)	0	(0)	-	-
234	0	(0)	0	(0)	0	(0)	2.38(4)	2.21(6)
238	0	(0)	0	(0)	0	(0)	-	-
241	0	(0)	0	(0)	0	(0)	3.75(3)	.50(2)
245	0	(0)	0	(0)	-	-	-	-
248	-		.50(1)	-	-	.70(5)	-	1.00(4)
252	-		0	(0)	-	-	-	-
255	-		0	(0)	-	.75(2)	-	1.50(1)
259	-		0	(0)	-	-	-	-

Day	Psyllidae				Pyrrhocoridae	
	Pitfall	Yellow pan		Sweepnet	Yellow pan	
	1979	1979	1980	1979	1979	
150	0 (0)	1.67(3)	0 (0)	-	0 (0)	
154	0 (0)	0 (0)	3.20(22)	-	0 (0)	
157	0 (0)	0 (0)	7.97(27)	-	0 (0)	
161	.10(1)	5.78(36)	14.86(26)	-	0 (0)	
164	.10(1)	1.83(12)	1.85(21)	-	0 (0)	
168	2.7 (1)	7.38(21)	2.33(20)	-	1.50(1)	
171	0 (0)	2.88(4)	6.67(31)	-	0 (0)	
175	8.5 (1)	3.29(23)	7.94(31)	-	.50(1)	
178	20.05(2)	2.25(2)	3.26(30)	-	.50(1)	
182	1.0 (1)	1.14(14)	1.30(5)	-	.75(2)	
185	.10(1)	1.31(13)	3.70(27)	.50(1)	1.00(2)	
189	0 (0)	1.13(16)	2.22(32)	-	.63(4)	
192	0 (0)	1.50(2)	1.69(26)	0 (0)	0 (0)	
196	.50(1)	.88(8)	1.75(8)	-	0 (0)	
199	0 (0)	3.50(1)	163.72(9)	.25(4)	0 (0)	
203	.10(2)	.96(14)	.80(17)	-	0 (0)	
206	.15(2)	1.75(2)	.67(3)	.25(2)	.50(1)	
210	.06(1)	1.17(6)	0 (0)	-	.50(1)	
213	0 (0)	1.00(1)	.83(3)	.50(1)	0 (0)	
217	.90(1)	1.00(6)	0 (0)	-	.50(2)	
220	.20(1)	.83(3)	.75(2)	.50(1)	0 (0)	
224	.20(1)	.75(4)	0 (0)	-	0 (0)	
227	0 (0)	.50(2)	.75(2)	.25(2)	0 (0)	
231	0 (0)	.81(8)	0 (0)	-	.50(1)	
234	0 (0)	1.50(5)	0 (0)	.25(1)	.50(1)	
238	0 (0)	.90(5)	0 (0)	-	.50(3)	
241	.06(1)	.50(3)	0 (0)	0 (0)	0 (0)	
245	0 (0)	0 (0)	-	-	0 (0)	
248	0 (0)	1.50(1)	-	0 (0)	0 (0)	
252	0 (0)	0 (0)	-	-	0 (0)	
255	0 (0)	1.00(1)	-	0 (0)	0 (0)	
259	0 (0)	.50(1)	-	-	0 (0)	

Carabidae

Day	Pitfall			Yellow pan		
	1979	1980	1981	1979	1980	1981
150	0 (0)	0 (0)	-	3.00(1)	0 (0)	-
154	0 (0)	5.46(7)	7.0(4)	0 (0)	2.84(19)	0 (0)
157	0 (0)	0 (0)	-	0 (0)	10.85(7)	-
161	2.40(2)	6.51(8)	8.65(13)	1.78(20)	1.97(15)	1.25(2)
164	1.41(10)	4.72(5)	-	1.86(7)	1.57(8)	-
168	4.23(8)	5.69(8)	3.31(17)	1.73(15)	.78(9)	.50(1)
171	2.12(6)	2.66(5)	-	2.5 (4)	1.77(11)	-
175	3.21(16)	8.6 (6)	8.04(16)	.63(4)	1.25(20)	0.87(1)
178	1.65(10)	5.2 (6)	-	.50(1)	1.37(23)	-
182	4.69(11)	0 (0)	14.43(15)	.50(2)	.50(1)	1.2 (5)
185	3.31(16)	9.03(15)	-	.50(3)	2.75(10)	-
189	3.64(17)	7.0 (10)	8.04(17)	.50(2)	1.00(8)	0.83(3)
192	3.84(8)	7.4 (11)	-	1.50(1)	.92(13)	-
196	4.95(13)	6.21(11)	5.05(17)	.50(3)	.75(4)	0 (0)
199	4.11(12)	14.1 (9)	-	.50(1)	.81(8)	-
203	4.53(18)	13.05(13)	6.35(14)	.50(3)	.38(4)	1.25(2)
206	1.88(8)	21.3 (11)	-	0 (0)	.67(9)	-
210	5.18(20)	13.15(11)	4.72(13)	.75(2)	.88(4)	0.5 (2)
213	3.16(7)	8.67(10)	-	0 (0)	.60(5)	-
217	4.99(15)	5.85(2)	2.96(8)	.50(1)	0 (0)	0 (0)
220	2.72(12)	11.95(20)	-	.50(2)	1.08(6)	-
224	1.66(5)	14.94(11)	3.86(5)	0 (0)	.72(9)	0 (0)
227	2.22(9)	9.36(13)	-	0 (0)	1.33(4)	-
231	2.15(13)	13.93(12)	2.46(8)	.50(1)	.75(2)	0 (0)
234	2.33(11)	11.66(10)	-	.50(2)	1.45(10)	-
238	2.32(11)	8.67(9)	.52(6)	.83(3)	.94(8)	0 (0)
241	1.15(6)	14.69(10)	-	.50(2)	.69(8)	-
245	.40(1)	4.1 (1)	.35(4)	0 (0)	-	-
248	1.06(7)	-	-	0 (0)	-	-
252	.27(4)	-	-	0 (0)	-	-
255	.35(2)	-	-	0 (0)	-	-
259	0 (0)	-	-	0 (0)	-	-

Coccinellidae

Day	Pitfall						Yellow pan					
	1979		1980		1981		1979		1980		1981	
150	0	(0)	0	(0)	-		0	(0)	0	(0)	-	
154	0	(0)	0.3	(1)	0.2	(1)	0	(0)	1.61	(19)	0	(0)
157	0	(0)	0	(0)	-		0	(0)	1.2	(5)	-	
161	0.1	(1)	0.1	(2)	0.13	(3)	.67	(3)	1.18	(11)	.50	(1)
164	0.43	(3)	0	(0)	-		.50	(2)	1.23	(11)	-	
168	0.2	(1)	0.1	(1)	0.2	(4)	.56	(9)	.88	(8)	0	(0)
171	0.1	(1)	0.4	(1)	-		.50	(1)	.84	(13)	-	
175	0	(0)	0.1	(2)	.30	(3)	.50	(1)	.58	(6)	0	(0)
178	2.0	(2)	1.15	(2)	-		83.83	(3)	.95	(18)	-	
182	0.35	(2)	0	(0)	2.7	(1)	.50	(1)	1.00	(1)	.75	(2)
185	0.3	(4)	0.2	(3)	-		.50	(2)	.80	(5)	-	
189	0.37	(3)	0.2	(3)	.17	(3)	.50	(3)	.63	(4)	.83	(3)
192	0.27	(4)	0.83	(4)	-		.75	(2)	.63	(4)	-	
196	0	(0)	0.2	(3)	.15	(2)	1.00	(1)	.50	(2)	1.00	(3)
199	0.23	(5)	.15	(2)	-		.50	(2)	.81	(13)	-	
203	0.2	(1)	.97	(3)	.20	(1)	.50	(1)	1.00	(9)	0	(0)
206	0.22	(6)	.30	(2)	-		1.50	(2)	1.57	(8)	-	
210	0.1	(1)	.37	(3)	.20	(1)	0	(0)	1.00	(4)	.75	(2)
213	0.61	(6)	.20	(4)	-		.50	(1)	.78	(9)	-	
217	0.35	(2)	0	(0)	0	(0)	.50	(1)	0	(0)	0.5	(1)
220	0.53	(8)	.35	(4)	-		.61	(5)	2.42	(12)	-	
224	0.15	(2)	.15	(2)	0	(0)	.63	(4)	.86	(14)	0	(0)
227	0.45	(5)	.20	(4)	-		.63	(4)	.50	(4)	-	
231	1.0	(3)	3.4	(1)	0	(0)	0	(0)	.67	(6)	0	(0)
234	0.20	(4)	0	(0)	-		1.00	(1)	.77	(13)	-	
238	0.15	(2)	.10	(1)	0	(0)	.70	(5)	.91	(5)	0	(0)
241	0.29	(4)	.10	(2)	-		.67	(3)	.75	(2)	-	
245	0	(0)	0	(0)	0	(0)	0	(0)	-		-	
248	0	(0)	-		-		1.00	(1)	-		-	
252	0	(0)	-		-		0	(0)	-		-	
255	0.2	(1)	-		-		0	(0)	-		-	
259	0	(0)	-		-		0	(0)	-		-	

Coccinellidae				
Day	Sweepnet		Ground cloth	
	1979	1980	1979	1980
150	-	-	-	-
154	-	-	-	-
157	-	-	-	-
161	-	-	-	-
164	-	-	-	-
168	-	-	-	-
171	-	-	-	-
175	-	-	-	-
178	-	0.25(2)	-	0 (0)
182	-	-	-	-
185	0 (0)	.63(2)	0 (0)	.75(1)
189	-	-	-	-
192	0 (0)	.33(3)	0 (0)	0 (0)
196	-	-	-	-
199	.35(5)	.50(2)	.38(2)	.25(1)
203	-	-	-	-
206	0 (0)	.25(1)	.25(1)	1.75(1)
210	-	-	-	-
213	.50(2)	1.65(5)	.25(3)	.30(5)
217	-	-	-	-
220	.75(12)	.83(15)	.61(7)	1.35(5)
224	-	-	-	-
227	.34(3)	1.72(9)	.25(1)	1.00(4)
231	-	-	-	-
234	.25(1)	1.69(4)	.50(3)	.50(2)
238	-	-	-	-
241	1.25(1)	.50(3)	0 (0)	.25(1)
245	-	-	-	-
248	0.25(1)	-	0 (0)	-
252	-	-	-	-
255	.38(2)	-	0 (0)	-
259	-	-	-	-

Elateridae						
Day	Pitfall			Yellow pan		
	1979	1980	1981	1979	1980	
150	0 (0)	0 (0)	-	0 (0)	0 (0)	
154	0 (0)	.88(4)	.8 (1)	0 (0)	.86(14)	
157	0 (0)	0 (0)	-	0 (0)	.50(4)	
161	4.8 (2)	1.48(5)	1.17(10)	.50(1)	.82(11)	
164	.40(7)	.80(1)	-	.75(2)	.83(3)	
168	.70(5)	4.7 (5)	.71(10)	1.07(7)	1.36(7)	
171	.98(4)	.25(2)	-	.83(3)	2.92(6)	
175	1.79(7)	3.22(6)	.59(12)	.50(1)	1.00(2)	
178	.27(7)	.20(4)	-	1.00(1)	1.33(21)	
182	1.18(4)	0 (0)	.40(1)	0 (0)	.50(1)	
185	.57(5)	.38(7)	-	.50(1)	1.67(3)	
189	.49(8)	.45(6)	.30(2)	.80(4)	.50(1)	
192	.05(2)	.68(6)	-	1.00(1)	.83(3)	
196	.78(4)	.89(1)	.20(1)	1.50(1)	0 (0)	
199	.34(4)	.35(4)	-	.50(1)	.67(3)	
203	.09(3)	.43(4)	.10(1)	.50(1)	.75(2)	
206	.20(4)	.40(1)	-	1.00(1)	.60(5)	
210	0 (0)	.10(1)	.20(1)	.50(1)	.50(2)	
213	0 (0)	.25(2)	-	0 (0)	.67(3)	
217	0 (0)	0 (0)	0 (0)	.50(1)	0 (0)	
220	.20(1)	.35(2)	-	0 (0)	.83(3)	
224	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
227	0 (0)	1.4 (1)	-	.50(1)	0 (0)	
231	.20(1)	0 (0)	0 (0)	0 (0)	0 (0)	
234	.10(1)	0 (0)	-	0 (0)	0 (0)	
238	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
241	0 (0)	.2 (1)	-	0 (0)	0 (0)	
245	0 (0)	0 (0)	0 (0)	0 (0)	-	
248	0 (0)	-	-	0 (0)	-	
252	0 (0)	-	-	0 (0)	-	
255	0 (0)	-	-	0 (0)	-	
259	0 (0)	-	-	0 (0)	-	

Halticidae

Day	Pitfall			Yellow pan		
	1979	1980	1981	1979	1980	1981
150	0 (0)	0 (0)	-	45.75(2)	0 (0)	-
154	0 (0)	1.40(5)	.80(1)	0 (0)	5.82(25)	4.50(2)
157	0 (0)	0 (0)	-	41.00(1)	6.39(18)	-
161	2.4 (2)	.43(4)	2.20(5)	23.53(31)	11.73(28)	34.50(3)
164	.3 (4)	2.10(4)	-	10.04(12)	21.71(23)	-
168	.2 (2)	2.75(2)	.28(5)	10.41(23)	3.08(26)	10.17(3)
171	.15(2)	1.72(5)	-	33.38(4)	10.29(29)	-
175	.18(4)	.33(3)	.96(11)	2.25(30)	7.53(30)	8.57(7)
178	.3 (6)	4.62(5)	-	9.09(6)	17.51(41)	-
182	.18(4)	0 (0)	.78(5)	3.29(14)	1.50(4)	5.60(5)
185	.21(5)	.68(5)	-	17.83(12)	14.40(24)	-
189	.42(3)	.10(2)	.34(8)	4.53(17)	5.02(19)	4.36(7)
192	.15(2)	.67(11)	-	2.12(4)	7.84(34)	-
196	.10(1)	0 (0)	.37(8)	2.56(8)	5.63(15)	0 (0)
199	1.0 (3)	.65(4)	-	125.83(3)	5.5 (29)	-
203	.08(2)	0 (0)	1.01(7)	1.07(7)	10.44(26)	2.15(7)
206	.60(2)	.68(4)	-	.50(2)	10.20(27)	-
210	.54(5)	.4 (1)	.93(7)	2.90(10)	4.61(19)	3.00(2)
213	.97(3)	.65(4)	-	1.00(1)	5.27(14)	-
217	0 (0)	0 (0)	1.3 (6)	3.06(18)	0 (0)	0 (0)
220	.87(4)	.20(4)	-	108.50(5)	3.05(19)	-
224	0 (0)	0 (0)	2.23(4)	1.63(4)	4.05(31)	7.00(1)
227	.34(5)	.10(2)	-	49.33(2)	4.75(28)	-
231	2.83(5)	0 (0)	2.07(7)	17.54(12)	8.21(24)	0 (0)
234	.12(5)	.30(1)	-	8.54(13)	8.64(33)	-
238	1.45(4)	0 (0)	.83(3)	5.42(18)	16.73(29)	0 (0)
241	.3 (1)	.8 (3)	-	5.07(7)	17.60(29)	-
245	0 (0)	0 (0)	.80(6)	0 (0)	-	-
248	.48(7)	-	-	11.50(4)	-	-
252	.13(3)	-	-	1.50(2)	-	-
255	.40(1)	-	-	2.00(1)	-	-
259	0 (0)	-	-	.50(1)	-	-

Day	Halticidae			
	Sweepnet		Ground cloth	
	1979	1980	1979	1980
150	-	-	-	-
154	-	-	-	-
157	-	-	-	-
161	-	-	-	-
164	-	-	-	-
168	-	-	-	-
171	-	-	-	-
175	-	-	-	-
178	-	26.63(4)	-	0 (0)
182	-	-	-	-
185	.25(1)	6.94(4)	.50(1)	0 (0)
189	-	-	-	-
192	.50(1)	2.67(3)	.25(1)	1.42(3)
196	-	-	-	-
199	1.00(5)	9.22(8)	.38(6)	2.32(3)
203	-	-	-	-
206	.25(1)	2.00(2)	0 (0)	0 (0)
210	-	-	-	-
213	2.25(15)	3.39(12)	2.13(4)	.75(5)
217	-	-	-	-
220	27.08(27)	1.55(10)	11.9 (24)	1.00(5)
224	-	-	-	-
227	66.05(5)	5.92(9)	31.19(4)	.54(6)
231	-	-	-	-
234	27.63(6)	6.62(17)	4.67(6)	5.3 (5)
238	-	-	-	-
241	38.25(3)	10.71(6)	26.00(2)	0 (0)
245	-	-	-	-
248	10.11(7)	-	7.12(4)	-
252	-	-	-	-
255	3.38(2)	-	.50(1)	-
259	-	-	-	-

Staphylinidae

Day	Pitfall			Yellow pan		
	1979	1980	1981	1979	1980	1981
150	0 (0)	0 (0)	-	.75(2)	0 (0)	-
154	0 (0)	3.0 (7)	4.5 (4)	0 (0)	4.96(25)	0 (0)
157	0 (0)	0 (0)	-	1.50(1)	110.38(13)	-
161	1.1 (3)	2.7 (8)	3.7 (13)	1.41(27)	2.00(22)	.50(1)
164	.87(8)	1.2 (4)	-	.94(6)	1.45(10)	-
168	1.36(7)	1.7 (9)	2.2 (14)	2.04(23)	1.28(18)	.67(3)
171	1.44(5)	.66(5)	-	1.75(1)	1.11(14)	-
175	1.82(14)	1.7 (6)	1.7 (15)	.88(20)	1.41(23)	1.25(6)
178	1.9 (8)	1.1 (6)	-	.60(5)	2.09(27)	-
182	2.3 (11)	0 (0)	1.4 (13)	.78(9)	.50(1)	.75(4)
185	3.6 (15)	2.0 (10)	-	1.58(12)	.83(9)	-
189	3.3 (16)	1.1 (8)	4.3 (16)	1.11(27)	.77(13)	.63(4)
192	8.1 (9)	.74(13)	-	2.00(4)	.75(12)	-
196	7.6 (13)	2.3 (9)	4.3 (13)	1.26(17)	.89(9)	.50(1)
199	1.9 (11)	.95(8)	-	1.50(4)	1.14(14)	-
203	7.8 (17)	2.2 (13)	2.2 (15)	1.07(15)	.86(7)	.50(1)
206	6.4 (8)	1.3 (8)	-	.50(1)	1.50(2)	-
210	4.5 (19)	2.0 (9)	2.7 (12)	1.60(5)	1.17(3)	0 (0)
213	1.6 (5)	1.5 (9)	-	.50(2)	1.00(5)	-
217	5.8 (14)	0 (0)	.78(6)	.94(8)	0 (0)	0 (0)
220	1.4 (10)	1.5 (18)	-	1.75(2)	1.58(6)	-
224	9.2 (4)	.76(8)	1.1 (3)	.60(5)	1.36(7)	0 (0)
227	4.5 (7)	1.2 (7)	-	.92(6)	.50(1)	-
231	2.1 (12)	1.6 (10)	1.6 (5)	1.44(9)	1.00(1)	0 (0)
234	.79(10)	.88(9)	-	1.50(4)	1.00(1)	-
238	2.8 (10)	1.0 (3)	.4 (2)	1.50(15)	.67(3)	0 (0)
241	.65(3)	1.3 (8)	-	.80(5)	1.25(4)	-
245	.3 (1)	0 (0)	.4 (2)	1.33(3)	-	-
248	.86(4)	-	-	0 (0)	-	-
252	.28(2)	-	-	2.00(1)	-	-
255	.85(2)	-	-	1.17(3)	-	-
259	0 (0)	-	-	0 (0)	-	-

Syrphidae

Day	Pitfall				Yellow pan				
	1979		1980		1979		1980		1981
150	0	(0)	0	(0)	6.0	(1)	0	(0)	-
154	0	(0)	0	(0)	0	(0)	0	(0)	-
157	0	(0)	0	(0)	0	(0)	0.5	(1)	-
161	0	(0)	0	(0)	0.50	(2)	0.5	(2)	0.5 (2)
164	0.1	(1)	0.2	(1)	0	(0)	0.5	(1)	-
168	0	(0)	0	(0)	1.5	(2)	0.5	(3)	1.0 (1)
171	1.8	(1)	0	(0)	1.0	(1)	0	(0)	-
175	0	(0)	0	(0)	0.5	(2)	0.67	(3)	2.11(9)
178	0	(0)	0	(0)	0	(0)	0.75	(6)	-
182	0	(0)	0	(0)	0	(0)	0	(0)	1.43(7)
185	0	(0)	0.1	(2)	1.0	(1)	1.0	(1)	-
189	0.2	(2)	0.1	(1)	1.79	(7)	0.67	(6)	2.81(8)
192	0.1	(1)	0.2	(1)	1.5	(1)	1.4	(5)	-
196	0	(0)	0	(0)	0.94	(8)	0.88	(4)	2.68(11)
199	0	(0)	0.1	(2)	0.5	(1)	0.85	(10)	-
203	0	(0)	0	(0)	1.21	(14)	1.1	(6)	2.6 (5)
206	0	(0)	0.13	(3)	1.0	(1)	1.43	(15)	-
210	0.4	(2)	0.20	(1)	1.42	(12)	1.07	(15)	2.71(7)
213	5.6	(1)	0.15	(2)	0	(0)	1.42	(25)	-
217	0.1	(1)	0.20	(1)	1.86	(22)	0	(0)	0 (0)
220	0.6	(1)	0.10	(2)	1.88	(4)	2.50	(26)	-
224	0	(0)	0.0	(0)	1.04	(12)	3.04	(49)	3.25(3)
227	0	(0)	0.13	(4)	1.50	(4)	2.79	(26)	-
231	0.1	(1)	0.20	(1)	2.46	(12)	2.57	(28)	0 (0)
234	0.0	(0)	0.15	(2)	0.85	(13)	2.95	(31)	-
238	5.0	(1)	0.10	(1)	3.32	(22)	2.98	(18)	0.5 (2)
241	0	(0)	0.60	(1)	2.21	(7)	9.98	(20)	-
245	0	(0)	0.10	(1)	0	(0)	-		-
248	0	(0)	-		2.0	(1)	-		-
252	0.1	(1)	-		0.67	(3)	-		-
255	0	(0)	-		7.25	(2)	-		-
259	0	(0)	-		0	(0)	-		-

Braconidae

Day	Pitfall						Yellow pan		
	1979	1980	1981	1979	1980	1981	1979	1980	1981
150	0 (0)	0 (0)	-	1.00(2)	0 (0)	-			
154	0 (0)	.15(2)	0 (0)	0 (0)	.75(8)	.50(1)			
157	0 (0)	0 (0)	-	.50(1)	.50(4)	-			
161	0 (0)	0 (0)	0 (0)	.91(16)	.75(2)	1.50(1)			
164	.10(2)	0 (0)	-	.83(3)	0 (0)	-			
168	.30(1)	0 (0)	0 (0)	1.17(6)	.50(1)	1.38(4)			
171	2.40(1)	0 (0)	-	.83(3)	.75(2)	-			
175	.25(2)	0 (0)	.20(1)	.73(11)	.50(1)	1.32(8)			
178	.25(1)	0 (0)	-	.50(1)	0 (0)	-			
182	0 (0)	0 (0)	.10(1)	.88(8)	.50(1)	1.25(4)			
185	.18(4)	.10(1)	-	.83(12)	1.00(6)	-			
189	.10(3)	0 (0)	.20(1)	.89(18)	1.00(2)	1.21(7)			
192	.30(1)	.20(1)	-	.83(2)	.75(2)	-			
196	1.13(3)	0 (0)	.40(1)	.79(21)	.50(1)	.64(7)			
199	.13(3)	0 (0)	-	.88(4)	2.25(2)	-			
203	.55(2)	0 (0)	0 (0)	1.25(22)	.67(3)	1.00(3)			
206	.40(2)	0 (0)	-	1.25(2)	.50(2)	-			
210	.20(3)	0 (0)	0 (0)	1.40(15)	.50(1)	1.50(5)			
213	.45(2)	.40(1)	-	3.00(1)	1.06(8)	-			
217	.40(1)	0 (0)	0 (0)	1.94(24)	0 (0)	.5 (1)			
220	.13(2)	.10(3)	-	2.59(6)	.71(2)	-			
224	.20(1)	0 (0)	0 (0)	8.95(21)	.93(7)	0 (0)			
227	0 (0)	0 (0)	-	4.63(8)	.70(5)	-			
231	.22(6)	0 (0)	.15(2)	6.41(21)	0 (0)	1.00(2)			
234	.27(5)	0 (0)	-	3.62(17)	.75(2)	-			
238	.20(7)	0 (0)	0 (0)	6.15(26)	.75(2)	1.00(1)			
241	0 (0)	0 (0)	-	3.06(8)	1.17(3)	-			
245	0 (0)	0 (0)	.30(1)	0 (0)					
248	.13(1)			1.5 (4)					
252	0 (0)			.75(2)					
255	0 (0)			.50(1)					
259	0 (0)			.50(1)					

Day	Braconidae		Bethylodea	Chalcididae		
	Sweepnet	Ground cloth	Yellow pan	Pitfall		
	1979	1979	1980	1979	1980	1981
150	-	-	0 (0)	0 (0)	0 (0)	-
154	-	-	.67(3)	0 (0)	.10(3)	0 (0)
157	-	-	0 (0)	0 (0)	0 (0)	-
161	-	-	0 (0)	.15(2)	0 (0)	0 (0)
164	-	-	0 (0)	.30(1)	.10(1)	-
168	-	-	.50(2)	.37(3)	.20(2)	.60(1)
171	-	-	.50(2)	1.40(1)	0 (0)	-
175	-	-	.60(5)	.17(3)	0 (0)	.20(1)
178	-	-	.50(2)	.33(4)	0 (0)	-
182	-	-	.50(1)	.65(2)	0 (0)	.10(1)
185	0 (0)	0 (0)	.50(1)	.41(5)	0 (0)	-
189	-	-	.50(1)	.45(2)	.20(2)	.20(1)
192	.33(3)	.25(1)	.50(1)	.15(4)	.15(2)	-
196	-	-	.50(2)	.45(4)	0 (0)	0 (0)
199	.69(4)	.25(1)	.50(1)	.57(7)	0 (0)	-
203	-	-	0 (0)	.50(5)	.10(1)	0 (0)
206	.41(8)	.50(1)	.50(1)	.36(4)	0 (0)	-
210	-	-	1.00(1)	.39(8)	0 (0)	0 (0)
213	1.47(8)	.56(4)	.50(1)	.15(3)	0 (0)	-
217	-	-	0 (0)	.44(7)	0 (0)	.20(1)
220	1.11(25)	.68(21)	0 (0)	.21(7)	.10(1)	-
224	-	-	0 (0)	.20(3)	0 (0)	0 (0)
227	.34(3)	.25(1)	0 (0)	.28(2)	0 (0)	-
231	-	-	0 (0)	.68(10)	0 (0)	0 (0)
234	.55(5)	.25(1)	0 (0)	.26(5)	.20(1)	-
238	-	-	0 (0)	.33(4)	0 (0)	0 (0)
241	.75(2)	0 (0)	0 (0)	.12(2)	0 (0)	-
245	-	-	-	.30(1)	0 (0)	0 (0)
248	.25(2)	.25(1)	-	.17(4)	-	-
252	-	-	-	.10(1)	-	-
255	0 (0)	0 (0)	-	0 (0)	-	-
259	-	-	-	0 (0)	-	-

Chalcididae

Day	Yellow pan			Sweepnet	Ground cloth
	1979	1980	1981	1979	1979
150	9.00(2)	0 (0)	-	-	-
154	0 (0)	1.19(24)	1.25(2)	-	-
157	0 (0)	1.34(9)	-	-	-
161	3.05(30)	.80(10)	2.5 (2)	-	-
164	1.47(18)	.77(11)	-	-	-
168	5.11(28)	1.19(8)	1.50(2)	-	-
171	9.63(4)	.67(6)	-	-	-
175	1.71(33)	1.21(12)	.89(7)	-	-
178	1.21(7)	.79(7)	-	-	-
182	2.57(23)	.50(2)	2.17(3)	-	-
185	2.88(20)	1.38(12)	-	0 (0)	0 (0)
189	2.96(36)	1.41(24)	1.94(8)	-	-
192	2.70(5)	1.77(13)	-	.75(1)	.25(3)
196	2.02(31)	1.50(9)	.79(7)	-	-
199	8.67(3)	.91(11)	-	.60(10)	.50(4)
203	2.31(29)	.58(6)	.79(7)	-	-
206	1.00(1)	.88(4)	-	.57(10)	.25(2)
210	3.08(20)	.75(2)	1.00(5)	-	-
213	3.25(2)	.75(4)	-	.45(14)	.25(1)
217	1.71(26)	0 (0)	1.75(2)	-	-
220	5.31(8)	.75(4)	-	.58(17)	.99(12)
224	5.50(15)	.50(3)	2.00(1)	-	-
227	1.5 (7)	2.50(1)	-	.50(1)	.60(5)
231	8.24(21)	.63(4)	1.00(2)	-	-
234	2.10(20)	.88(4)	-	.67(3)	2.75(2)
238	9.96(27)	0 (0)	1.25(2)	-	-
241	3.94(8)	0 (0)	-	.63(2)	.25(2)
245	0 (0)	-	-	-	-
248	3.30(5)	-	-	0 (0)	0 (0)
252	2.38(4)	-	-	-	-
255	9.33(3)	-	-	.50(1)	0 (0)
259	.50(1)	-	-	-	-

Formicidae

Day	Pitfall			Yellow pan		Sweepnet
	1979	1980	1981	1979	1980	1980
150	0 (0)	0 (0)	-	0 (0)	.50(1)	-
154	0 (0)	1.47(6)	14.10(2)	0 (0)	.67(3)	-
157	0 (0)	0 (0)	-	0 (0)	.70(5)	-
161	3.6 (2)	2.39(7)	6.84(12)	.50(4)	.50(4)	-
164	5.07(8)	.37(3)	-	.50(2)	.67(3)	-
168	2.06(8)	1.47(9)	1.78(12)	.70(5)	.67(3)	-
171	2.17(3)	.20(4)	-	0 (0)	1.00(2)	-
175	1.48(11)	1.53(6)	4.87(13)	.50(4)	.75(6)	-
178	1.92(7)	8.37(3)	-	1.00(1)	.60(5)	.25(1)
182	1.60(9)	0 (0)	4.87(10)	0 (0)	.83(3)	-
185	1.26(9)	.91(12)	-	1.00(1)	1.00(4)	0 (0)
189	.88(14)	1.57(9)	7.49(13)	.50(4)	.75(6)	-
192	.30(7)	3.26(8)	-	.75(2)	.50(1)	.50(1)
196	1.53(10)	1.93(7)	2.73(11)	.50(5)	0 (0)	-
199	1.48(10)	.82(6)	-	1.00(2)	.67(3)	.25(1)
203	1.05(10)	1.27(7)	2.47(11)	.56(8)	.50(1)	-
206	1.79(8)	.55(9)	-	0 (0)	0 (0)	.25(1)
210	1.50(13)	.68(9)	2.4 (9)	.75(2)	1.00(1)	-
213	.25(4)	.28(6)	-	.50(1)	.50(1)	.25(1)
217	1.89(7)	8.4 (1)	.7 (5)	.50(1)	0 (0)	-
220	.54(8)	.57(12)	-	0 (0)	3.25(2)	0 (0)
224	.15(2)	.57(7)	14.6 (1)	0 (0)	.50(2)	-
227	.15(2)	1.65(8)	-	1.00(1)	1.00(2)	0 (0)
231	2.17(6)	.85(4)	7.2 (1)	1.08(6)	.50(1)	-
234	.97(5)	.28(4)	-	1.10(10)	.75(4)	2.00(2)
238	.10(3)	.53(3)	.33(3)	1.06(17)	0 (0)	-
241	.38(2)	.64(5)	-	.94(8)	0 (0)	.25(1)
245	0 (0)	0 (0)	.30(1)	0 (0)	0 (0)	-
248	.25(2)	-	-	.50(1)	-	-
252	0 (0)	-	-	.75(2)	-	-
255	.10(1)	-	-	.50(1)	-	-
259	0 (0)	-	-	0 (0)	-	-

Ichneumonidae

Day	Pitfall		Yellow pan			Sweepnet
	1979	1980	1979	1980	1981	1980
150	0 (0)	0 (0)	.50(1)	0 (0)	-	-
154	0 (0)	.30(2)	0 (0)	3.96(24)	0 (0)	-
157	0 (0)	0 (0)	0 (0)	1.23(11)	-	-
161	.10(1)	.16(5)	1.05(22)	1.70(18)	1.00(1)	-
164	.40(1)	0 (0)	.75(10)	1.5 (12)	-	-
168	.30(2)	.10(1)	1.00(12)	1.00(16)	1.25(2)	-
171	.20(1)	.20(1)	1.00(2)	1.07(14)	-	-
175	.10(1)	.23(3)	.73(18)	1.32(17)	2.17(3)	-
178	.60(1)	.15(2)	1.33(3)	1.21(28)	-	0 (0)
182	.20(1)	0 (0)	.50(6)	.88(4)	.50(3)	-
185	0 (0)	1.48(4)	1.31(13)	.86(11)	-	.25(1)
189	.13(2)	.20(2)	.91(23)	.91(16)	.50(4)	-
192	.20(1)	6.44(5)	1.13(4)	1.11(18)	-	0 (0)
196	.80(3)	.10(1)	.96(14)	.77(11)	.63(4)	-
199	.13(3)	.10(1)	.75(2)	1.21(12)	-	.25(2)
203	.06(1)	.60(1)	.88(13)	.60(10)	.70(5)	-
206	.20(3)	.20(1)	.75(2)	.75(14)	-	0 (0)
210	.06(1)	.15(2)	.73(13)	.71(12)	1.34(6)	-
213	0 (0)	.17(3)	1.00(1)	1.08(18)	-	.40(5)
217	.10(2)	0 (0)	.72(18)	.50(1)	1.00(1)	-
220	.20(1)	0 (0)	.80(5)	.89(22)	-	.63(2)
224	.20(1)	.10(1)	1.06(9)	.77(22)	0 (0)	-
227	0 (0)	2.50(2)	.50(3)	.56(8)	-	.25(4)
231	.40(1)	0 (0)	.67(9)	1.10(10)	1.00(1)	-
234	0 (0)	.17(3)	1.00(8)	1.15(17)	-	.31(4)
238	.40(1)	0 (0)	1.24(17)	1.39(15)	2.00(1)	-
241	0 (0)	0 (0)	.50(4)	.65(14)	-	0 (0)
245	0 (0)	0 (0)	0 (0)	-	-	-
248	.20(1)	-	1.00(2)	-	-	-
252	0 (0)	-	0 (0)	-	-	-
255	0 (0)	-	1.00(1)	-	-	-
259	0 (0)	-	0 (0)	-	-	-

Proctotrupoidea

Day	Pitfall	Yellow pan		Sweepnet	Ground cloth
	1980	1979	1980	1979	1979
150	0 (0)	4.50(3)	0 (0)	-	-
154	.10(1)	0 (0)	2.02(21)	-	-
157	0 (0)	.50(1)	1.50(10)	-	-
161	.15(2)	2.83(33)	1.59(18)	-	-
164	0 (0)	.94(16)	1.14(11)	-	-
168	0 (0)	3.52(29)	1.78(29)	-	-
171	0 (0)	5.17(3)	1.85(27)	-	-
175	.67(3)	1.53(23)	3.69(29)	-	-
178	.25(2)	.90(5)	2.63(29)	-	-
182	0 (0)	2.82(19)	1.36(11)	-	-
185	2.57(3)	3.28(20)	.90(15)	0 (0)	0 (0)
189	.35(4)	2.20(38)	1.38(20)	-	-
192	.20(3)	1.30(5)	.91(11)	.25(3)	.25(1)
196	.10(2)	1.80(28)	1.08(6)	-	-
199	0 (0)	7.5 (3)	.63(4)	1.17(3)	.25(1)
203	0 (0)	2.47(33)	.60(5)	-	-
206	.10(1)	.50(1)	.64(7)	.25(3)	.25(2)
210	0 (0)	2.02(26)	.75(4)	-	-
213	.10(1)	2.75(2)	.50(3)	.99(9)	.56(4)
217	0 (0)	2.45(30)	0 (0)	-	-
220	0 (0)	4.22(7)	1.50(4)	.75(20)	.70(13)
224	.10(1)	8.11(19)	2.71(19)	-	-
227	0 (0)	3.66(9)	1.73(13)	.38(2)	.38(2)
231	0 (0)	10.82(22)	1.85(17)	-	-
234	.20(3)	3.65(20)	1.93(14)	.69(4)	2.00(5)
238	0 (0)	21.71(26)	2.43(16)	-	-
241	.20(1)	8.33(9)	1.50(9)	.54(6)	.25(1)
245	0 (0)	0 (0)	-	-	-
248	-	4.90(5)	-	.50(1)	.25(1)
252	-	2.17(3)	-	-	-
255	-	12.17(3)	-	.25(1)	0 (0)
259	-	.50(1)	-	-	-

¹ Julian date for 1980 (e.g. 1979 = 151; 1980 = 150; 1981 = 151).

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Boiteau, Gilles.
The arthropod fauna of potato
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